



PAPHIOPEDILUM STRIATUM (ORCHIDACEAE), A NEW SPECIES FROM PAPUA NEW GUINEA

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ABSTRACT

: *Paphiopedilum striatum* (Orchidaceae: Cyripedioideae), collected in the Southern Highlands of Papua New Guinea and erroneously treated as *P. wilhelminae*, is described as a new species.

The genus *Paphiopedilum* Pfitzer is represented in New Guinea by two taxonomic sections, viz *Coryopedilum* Pfitzer and *Barbata* Kraenzl. (Cribb 1987). The exact number of species present in both groups has been the subject of much discussion (for example Asher 1980, 1986, Braem 1988, Fowlie 1991, Reisinger 1993, 1994a).

Garay (1995), in a recent comprehensive review of the *P. praestans* (Rchb.f.) Stein complex, based on an objective analysis of the relevant types and original protologues, recognised four species; *P. praestans* (including two or three varieties), *P. glanduliferum* (Blume) Stein., *P. gardineri* Guillemard and *P. wilhelminae* L.O. Williams. We agree with his assessment of the complex, disagreeing only on the interpretation of the plant illustrated by Cribb (1987) under the name *P. glanduliferum* var. *wilhelminae* which is here described as a new species.

In 1978 Tom Reeve discovered a population of a *Paphiopedilum* in the Southern Highlands Province of Papua New Guinea, identifying them as *P. wilhelminae*. The following year, the Australian National Botanic Gardens received six living plants from this collection as part of a consignment of New Guinea orchids. We understood the plants to represent six clones of the species.

Large numbers of seedlings have successfully been propagated *in vitro* by Roger Kramer from seeds originating from a cross between two of these clones. These seedlings have since flowered and the major diagnostic features, apparent in the parents, are also present in the seedlings, confirming the stability of these characters for diagnostic purposes. We conclude that the Reeve collection represents a different taxon from *P. wilhelminae* and is an undescribed species. It is here described for the proposed treatment of Papua New Guinea Orchidaceae as part of a cooperative program between the National Capital Botanical Gardens, Port Moresby, Papua New Guinea and the Australian National Botanic Gardens/Centre for Plant Biodiversity Research, Canberra, Australia.

MATERIALS AND METHODS

The description of the new species was made from a range of sources including fresh living plants, dried herbarium specimens, spirit preserved specimens stored in BANG mix (65 % ethanol, 5 % glycerol and 30% water), floral dissection cards and 35 mm colour transparencies of flowers and plants. Specimens were examined from the following herbaria: BRI, CANB, CBG, K, L, MEL and W. Herbarium abbreviations follow

Holmgren et al. (1990). Unless otherwise indicated, all types (or photographs thereof) and collections cited have been seen.

Paphiopedilum striatum

M.A. Clem. et D.L. Jones, *spec. nov.*

affinis *P. wilhelminae* L.O. Williams et *P. gardineri* (Guillemard) Pfitzer sed floribus 1-3, distanter dispositis; sepalis prominente striatis; petalis semel torsivis, processis glandulosis in marginibus basalibus carentibus; sepalo dorsali obovato; synsepalo ovato-lanceolato emarginato; et staminodio quadrato, differt.

TYPE: cultivated at Australian National Botanic Gardens, Australian Capital Territory, Canberra, 17 Sept. 1985, J.M. Taylor 2498 (Holotype CANB). PROVENANCE: plant originally collected in Southern Highlands [precise locality withheld for conservation purposes], Papua New Guinea, July 1978, T.M. Reeve 78.

[*Paphiopedilum wilhelminae* auct., non L.O. Williams; Reeve, *Orchadian* 6(7): 152, f. (1980)]

[*Paphiopedilum glanduliferum* (Blume) Stein var. *wilhelminae* auct., non (L.O. Williams) P.J. Cribb; P.J. Cribb, *The Genus Paphiopedilum*. 111, f. (1987); Cruttwell, *Orchadian* 9(11): 245 (1990)]

Terrestrial or lithophytic **herb** to 40 cm tall. **Rhizome** short, covered by leaf bases. **Roots** fleshy, brown; c. 3-4 mm wide, covered in root hairs, arising from the base of "growths". **Leaves** 4-6 on each "growth", oblong-linear, when mature 25-36 cm x 18-25 mm, coriaceous, porrect to erect, alternate, conduplicate, glabrous, light green, persistent and with a minutely bifid apex; lowermost leaves reduced and bract-like. **Inflorescence** 1-3-flowered, two to three times longer than the leaves, arising from

the centre of a mature "growth", subtended by an ensheathing oblong-linear bract; bract with a slightly recurved apex, to 10 cm x 10 mm. **Peduncle** terete, 18-32 cm long, minutely pubescent throughout, erect to semi-pendulous, reddish-brown. **Floral bracts** lanceolate, 28-40 mm x 12-20 mm, conduplicate, persistent, minutely hirsute along the basal margin. **Pedicels** glabrous, 8-15 mm x c. 2 mm, dark reddish-brown, obscurely differentiated from the ovary. **Ovary** fusiform, 35-40 mm x c. 4 mm, glabrous, dark reddish-brown. **Flowers** erect, 9-10 cm x 10-12 cm; sepals white with reddish-maroon longitudinal striations, petals light greenish-brown with darker striations, the mid-vein prominent; labellum dull yellow, prominently streaked with light red towards the base; staminode disc prominent, large, yellow with brownish hairs on its margin. **Dorsal sepal** erect, ovate, 43-46 mm x 24-26 mm, cucullate, rostrate, glabrous except for a few cilia on the apical margins, with a median dorsal keel, and campylodromous veining with 12-13 distinct broad longitudinal nerves. **Petals** linear-lanceolate, 50-85 mm x 7-8 mm, spreading widely, with one complete twist, basal margins crispate-undulate, with multicellular dark cilia to 2 mm long, the central third on the anterior side glabrous, dorsally covered with short brown, glandular cilia, extending to the margins, thickest nearest the acuminate apex. **Labellum** deeply urceolate, 48-50 mm long and c. 18 mm in diameter at the mouth of the pouch; claw c. 25-30 mm long, oblong to quadrate when expanded, the margins involute, touching or slightly overlapping at the apex, the inner horn-like processes 3 mm long, glabrous on the dorsal side, with multicellular cilia on the proximal half on the ventral side; pouch 20-25 mm long,



rounded, truncate. **Column** c. 18 mm long; staminode prominent, quadrate, 15-18 mm x c. 15 mm, free almost to the base, the dorsal central area naked, shiny, yellow, reddish towards the middle, concave towards the apex, truncate, the rim verrucose except for the apex, dorsally with two small, blunt, auriculate calluses, and margins with thick multicellular red hairs, sparser towards the base. **Stigma** suborbicular, convex, shiny. **Anthers** two, one either side of the column, on short filaments. **Pollinia** oblong-reniform, orange, soft, waxy, sticky. **Capsule** fusiform, elongate. **Fig. 1 & Plate 1A, B & C.** FLOWERING PERIOD: Collected in flower in July, flowering July to September in cultivation, perhaps also sporadically at other times.

ILLUSTRATIONS: page 111, Cribb (1987) (as *Paphiopedilum glanduliferum* var. *wilhelminae*); page 245, top plate, Cruttwell (1990) (as *Paphiopedilum glanduliferum* var. *wilhelminae*).

DISTRIBUTION: Apparently restricted to a small area in the Southern Highlands of Papua New Guinea.

HABITAT: Terrestrial or lithophytic growing on limestone rubble and forming big clumps. Most plants apparently grow in exposed situations in full sunlight. Altitude: c. 1200-1800 m.

RECOGNITION: *Paphiopedilum striatum* is characterised by the following combination of features; one to three widely spaced flowers; prominently striped sepals; petals twisted in one complete revolution, lacking glandular processes along the basal margins; dorsal sepal obovate; synsepal ovate-lanceolate, emarginate; and staminode quadrate.

AFFINITIES: *Paphiopedilum striatum* belongs to the *P. praestans* complex (**Plate 1A & 1E**), differing from that species in having smaller flowers with a blunter labellum, petals

lacking glandular processes along the basal margins, an obovate rather than lanceolate dorsal sepal, and a quadrate rather than linear-oblong staminode. From *P. wilhelminae* it differs in having up to three widely spaced flowers, twisted petals, ovate-lanceolate synsepal with a minutely emarginate, papillate apex, more prominently striped segments and a quadrate rather than linear-oblong staminode. Perhaps the closest species is *P. gardineri* (Garay 1995) (**Plate 1D**), which is a smaller growing species that has mostly one or two (rarely three) smaller flowers in cultivation with shorter, narrower, petals with a few glands along the margins, a broader labellum pouch and a red trapezoid staminode.

NOTES: Cribb (1987) has argued that the differences between taxa in this group merely represent variation within the species *P. glanduliferum*. Garay (1995), published an alternate view in which he clearly defined each taxon in the complex and provided a key based primarily on the shape of the staminode, which is a critical diagnostic feature for the genus. These features are readily recognisable in cultivated plants and have proved to be very stable in hundreds of siblings of each taxon (R. Kramer pers. comm.).

The new species is isolated from any known population of other species in the complex and is therefore unlikely to be able to interbreed with them. As pointed out by Garay (1995), both *P. glanduliferum* and *P. wilhelminae* are unknown in cultivation and so direct comparison of living material is impossible.

Until a thorough analysis of the group can be carried out, using molecular or isoenzyme techniques, it is not possible to elucidate the phylogeny of these taxa. We

believe it is imperative that each distinctive population should be recorded before it is lost to science, through poaching, destruction of habitat or other events.

CONSERVATION STATUS: On the basis of collection data it would appear the new species is of restricted distribution and not very common.

ETYMOLOGY: From the Latin 'striatus' meaning striped, in reference to the conspicuously striped flowers.

SPECIMENS EXAMINED: PAPUA NEW GUINEA: Southern Highlands Province; July 1980, T.M. Reeve 455 (CANB! E, K! L! LAE); Sept. 1981, T.M. Reeve 4276, (CANB! K, LAE, NSW).

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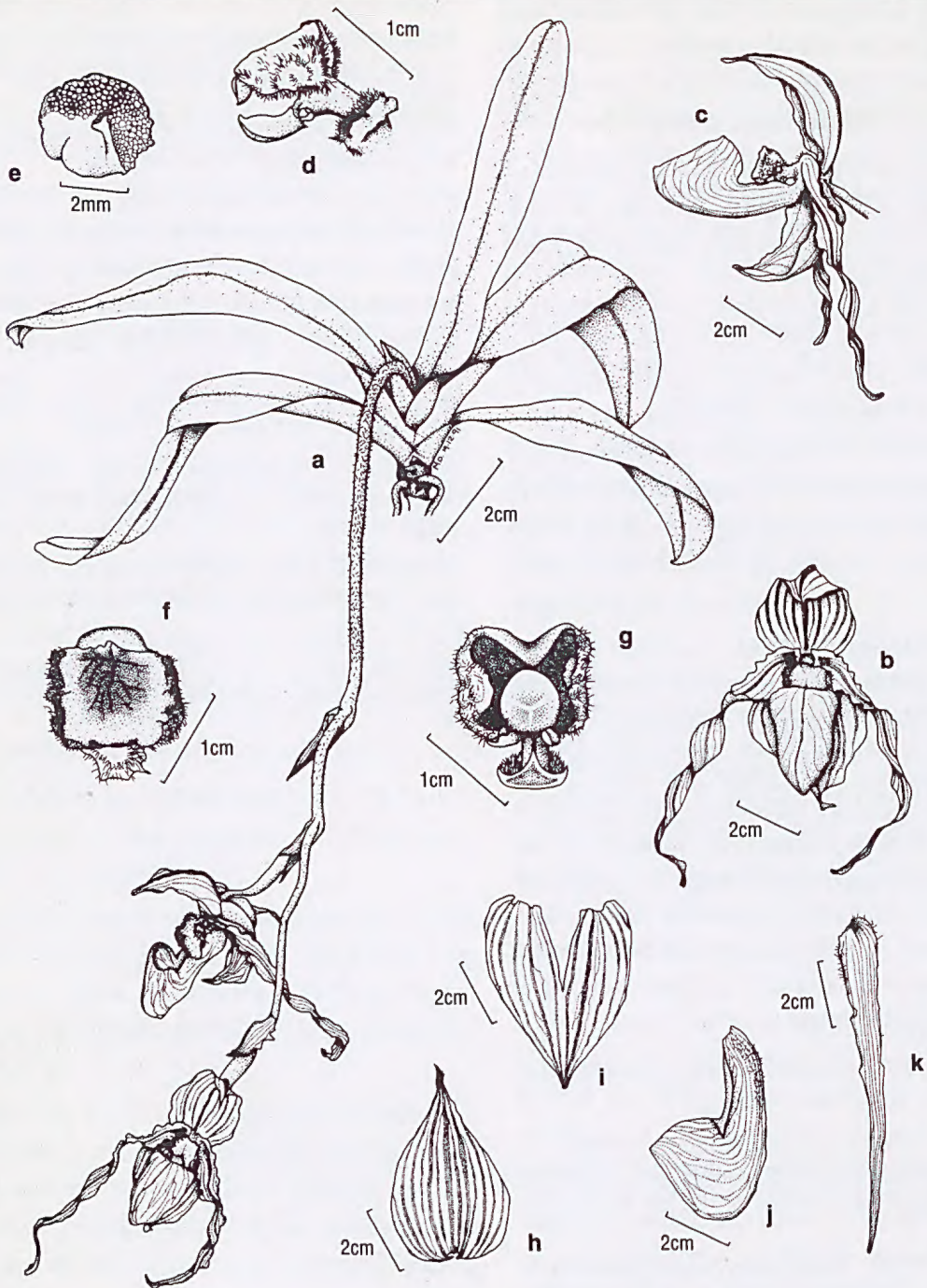


Figure 1. *Paphiopedilum striatum*, Southern Highlands Province, Papua New Guinea, Reeve 78: **a.** plant: **b.** flower from front: **c.** flower from side: **d.** column from side: **e.** anther: **f.** column from front: **g.** column from rear: **h.** dorsal sepal: **i.** synsepal: **j.** median section through the labellum: **k.** petal.



Plate 1A. Comparison between plants of *Paphiopedilum gardineri* (left), *P. praestans* (centre) and *P. striatum* (top and right) in cultivation.



Plate 1D. *Paphiopedilum gardineri*.

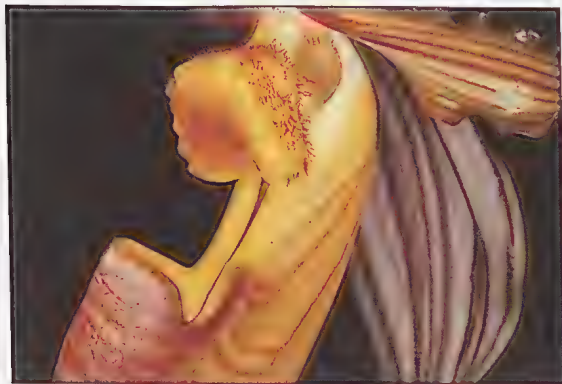


Plate 1B. Staminode of *P. striatum* from the side.



Plate 1E. *Paphiopedilum praestans*.

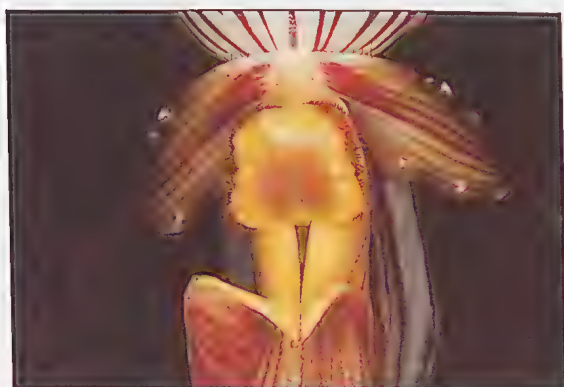


Plate 1C. Staminode of *P. striatum* from the front.



Plate 1F. *Paphiopedilum violaceum*.